66339 - Control and protection of power systems with renewable generation

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	535 - Master's in Renewable Energies and Energy Efficiency
ECTS	5.0
Course	1
Period	Second semester
Subject Type	Optional
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

The teaching process will involve three main levels: lectures, learning activities based on the resolution of problems and case studies, with a very high level of student participation and finally, conducting technical work subject where the student must demonstrate the knowledge and skills acquired to pose a problem, establish the state of the art and solve the technical problem concerning the protection and control of electrical systems references.

5.2.Learning activities

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The program offered to achieve the expected results includes the following activities:

Theory sessions: presentation of the technical concepts of the subjects addressed through lectures. Part of matter will be addressed through papers, which will be discussed in class as an exercise of self-learning.

Good practices : These exercises will be solved by the student (usually in small groups) and discussed among groups for understanding theoretical concepts presented.

Laboratory: simulation analysis for network studies.

Work course: focused technology development. In this paper, students will study and analyze the state of art on a particular topic assigned by the teacher and obtain and submit their own conclusions in a particular aspect of the subjec.

5.3.Program

The contents of the program to be developed are:

I. Transients in power systems

II. Insulation coordination

III. Power system protection and analysis of events

IV. Voltage and frequency control

V. HVDC

5.4.Planning and scheduling

Schedule sessions and work presentations

Lectures, classes of problem and laboratory sessions are given according to schedule set by the center and published prior to the course start date (http://eina.unizar.es).

Each teacher will inform of its tutorial hours.

The other activities will be planned depending on the number of students and will be announced in good time. It will be available on http://moodle.unizar.es

5.5.Bibliography and recomended resources

Coodinación de aislamiento en redes eléctricas de alta tensión. Mc. Graw-Hill, 2008
Insulation coordination for power systems, A.R. Hileman, Marcel Dekker, 1999.
Circuitos de parámetros distribuidos. M. García-Gracia, M.A. García García.

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Computer relaying for power systems, A.G. Phadke, J.S. Thorp, john Wiley & Sons, 1994.